1886MNRAS..46..334M

Note on M. Trouvelot's Paper. By E. W. Maunder.

It is to be regretted that M. Trouvelot did not wait until he had seen the actual text of my paper before replying to it, as the report on which he based his reply was a very inaccurate one. I did not call in question his ability to see the whole of a large prominence at once through a widely opened slit, nor even the possibility of his seeing an entire prominence projected on the spectrum. But I pointed out that one of his observations, taken as it stood, involved, according to the accepted interpretation of the displacement of lines in prominence spectra, that the prominence in question was moving with every conceivable velocity from rest up to 2,584 kilomètres per second. We cannot imagine the possibility of such a state of things, of a body being at one and the same time in a state of rest, of gentle motion, and of rapid motion; clearly either the observation must be incorrect, or the interpretation of it.

M. Trouvelot's present paper makes it clear, I think, that it is the observation that is in fault. Taken as it stands it amounts to the assertion that with a slit only a few seconds wide, and placed tangentially close to the Sun's limb, he was able to see an object nearly 2′ away from the limb, or much more than $1\frac{1}{2}'$ outside his slit. In other words, that on occasion he is able to see a prominence through the solid metal of his slit-plate; or rather through one plate of his slit, for whilst one plate was diaphanous to the prominence the other remained opaque.

It is clear that there is some error in the report of such an observation. Probably, and this would account for the entire phenomenon, the slit, when M. Trouvelot tried to close it, refused to answer its screw, as slits will occasionally, and therefore remained fully open during the entire observation. However this may be, it is clear that any spectrum can only correspond to the light actually admitted through the slit, and that the displacement of lines *within* that spectrum cannot bring within the range of the slit objects that are placed far outside it.

For observations of displacements of the lines of prominences M. Trouvelot would find a narrow radial slit much preferable to a wide tangential one, and if instead of reversing his spectroscope as a check on his observations he had made his slit radial, he would at once have seen whether these marvellous displacements were real or not.

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On the Semi-diameter of Venus. By W. G. Thackeray.

(*Communicated by Mr. Downing.*)

In the *Monthly Notices*, vol. xxv. p. 57, Mr. Stone has discussed the observations of *Venus* with the Greenwich Mural and Transit Circles for the years 1839–62. Assuming that the error arising from personality is sensibly eliminated when the number of observers is considerable, and that it is practicable when the number of observations are sufficiently numerous to separate the constant part of the diameter due to the instrument from the part which varies with every change in the planet's distance, he obtained a correction to be applied to the *N.A.* semi-diameter when a single limb only was observed—

viz. $+0''.392 \quad + (0.0269 \times$ *N.A.* semi-diameter.)

a correction which has been applied to the Greenwich observations when needed up to the present time. In 1865 Encke's value ($8''.305$) of the semi-diameter at the mean distance of the Sun from the Earth was used in the *Nautical Almanac*, instead of the value previously used, $8''.250$. Let $8''.305\,(1+y)$ be the true semi-diameter, and let x be the constant quantity by which the computed diameter would require to be corrected to agree with the observed diameter. Then, $x + (1+y)$ *N.A.* diameter = observed diameter. Taking the values of the *N.A.* and observed vertical diameters, as given in the planetary results of the Greenwich observations for the years 1866–84, and separating the observations into two classes, those above $20''$ and those below $20''$ in diameter, by simple summation, we get two equations for the determination of the values of x and y:—

$$302x + 10192.2y = 431.66$$
$$590x + 7629.4y = 757.75$$

from which we obtain

$$x = +\ 1''.196 \pm$$
$$y = +\ 0.0067 \pm$$

This gives the value of the semi-diameter at the mean distance of the Sun from the Earth $= 8''.360$, and the correction to be applied in the case of a single limb being observed becomes

$+\ 0''.598 + (0.0067 \times$ *N.A.* semi-diameter).

Now let us assume that the error of personality is not sufficiently eliminated by the number of the observers, and only use

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